Virchows Arch (2001) 438:66–69
DOI 10.1007/s004280000298

ORIGINAL ARTICLE

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Angiomyxolipoma shares cytogenetic changes with lipoma, spindle cell/pleomorphic lipoma and myxoma

Received: 21 March 2000 / Accepted: 21 June 2000 / Published online: 1 November 2000

Abstract Angiomyxolipoma is a rare variant of lipoma, two cases of which have recently been described. We report on the hitherto unreported clonal chromosomal changes of a third case of angiomyxolipoma. The karyotype showed a 46,XX,t(7;13)(p15;q14),t(8;12)(q13;p13)[17]/46,XX[3]. The involvement of 13q14, 12p13, and 8q13 supports a relationship with other types of benign lipomatous and myxoid tumors.

Keywords Lipoma · Angiomyxolipoma · Cytogenetics · Chromosomes

Introduction

Adipose tissue tumors represent the most common soft tissue neoplasms in adults, and most benign lipomatous tumors do not present any particular diagnostic problem. Depending on the location or on the presence of other tissue elements, different subtypes of lipoma are described: synovial ("lipoma arborescens"), parosteal, intraosseous, lumbosacral and thymolipoma; spindle cell/pleomorphic and chondroid lipoma, angio-, fibro-, myxo-, chondro-, osteo-, and myolipoma [4]. Recently, two cases of an apparently very rare subtype of lipoma have been described, for which the descriptive term angiomyxolipoma or vascular myxolipoma was proposed [10,17]. One tumor was localized in the spermatic cord, whereas the other presented as a subcutaneous nodule. We present hitherto unreported clonal chromosomal changes in a subcutaneous angiomyxolipoma. The chromosomal aberrations suggest a relationship with other types of lipoma and with myxoma.

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Materials and methods

Clinical history

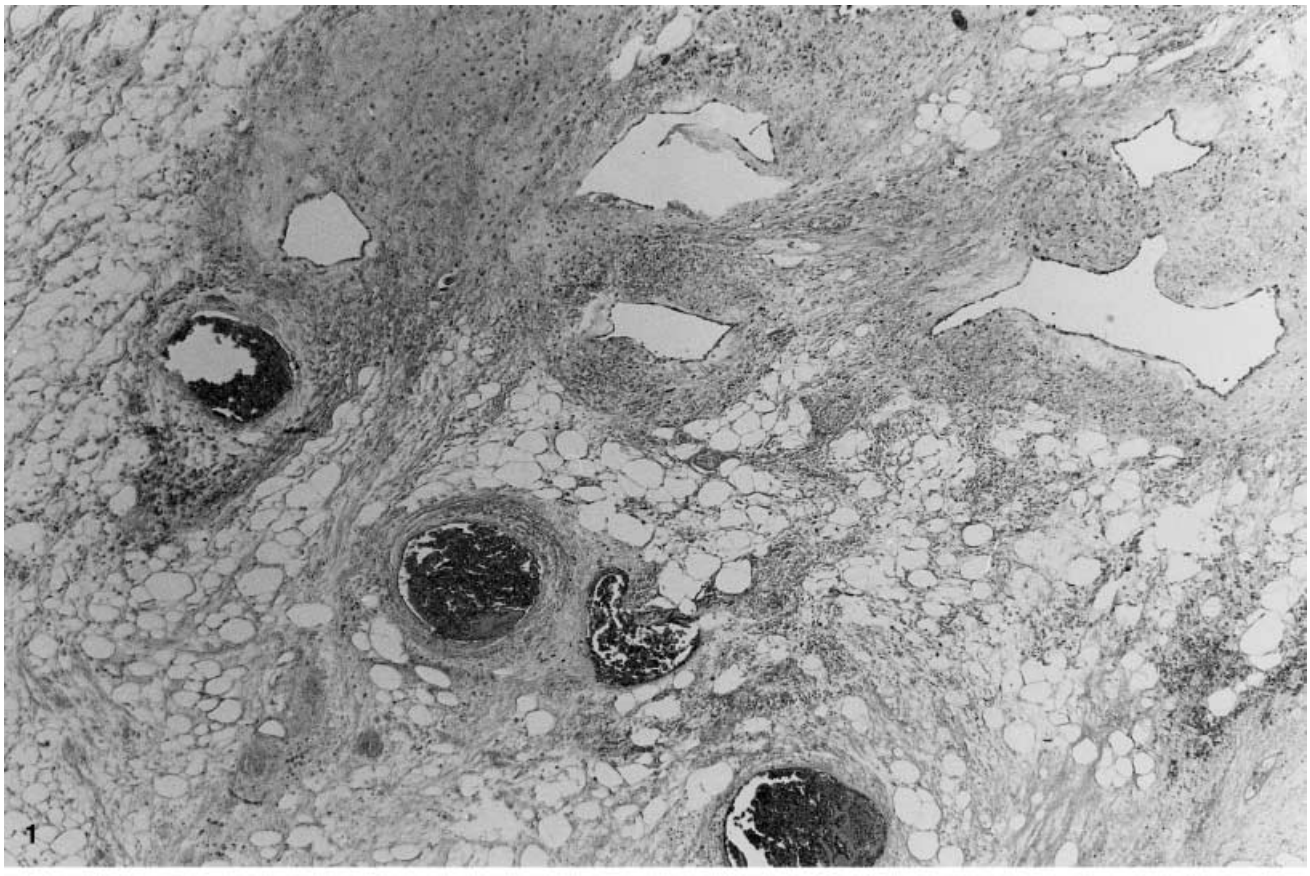
A 60-year-old women noticed a progressive painless swelling at the upper part of the left lateral thigh developing over 4 months. On clinical examination, a mobile lump was found in the subcutaneous tissue. Its consistency was somewhat firmer than that of a lipoma. Ultrasound imaging showed a hyperechogenic mass and on CT scan the mass of 62×50×45 mm displayed some areas of fat density. The X-ray of the chest was normal. A wide resection was performed including the underlying fascia and the recovery was uneventful. Over the following 6 months, no recurrence was documented.

Methods

The tumor was received fresh. Part of the tumor was fixed in formalin and processed as far as paraffin embedding. Immunoperoxidase stains were performed with CD34(monoclonal(mc), 1/10, Becton-Dickinson) and HMB45(mc, 1/100, Biogenics) antibodies. Chromosome analysis was performed on G-banded metaphases obtained after short-term culture of a suspension of enzymatically disaggregated cells, according to methods published previously [9]. Karyotypes were described using ISCN criteria [7].

Results

The tumor consisted of a subcutaneous nodule of 6 cm. The cut surface showed a yellowish fatty to gelatinous appearance. Microscopically, the tumor was well delineated but not encapsulated and showed an admixture of adipocytes and relatively large dilated vessels. In some vessels thrombi were present. No atypia was present in the adipocytic component. In many areas, the adipose tissue was replaced by loosely textured myxoid tissue, containing scattered fibroblast-like cells but a fascicular



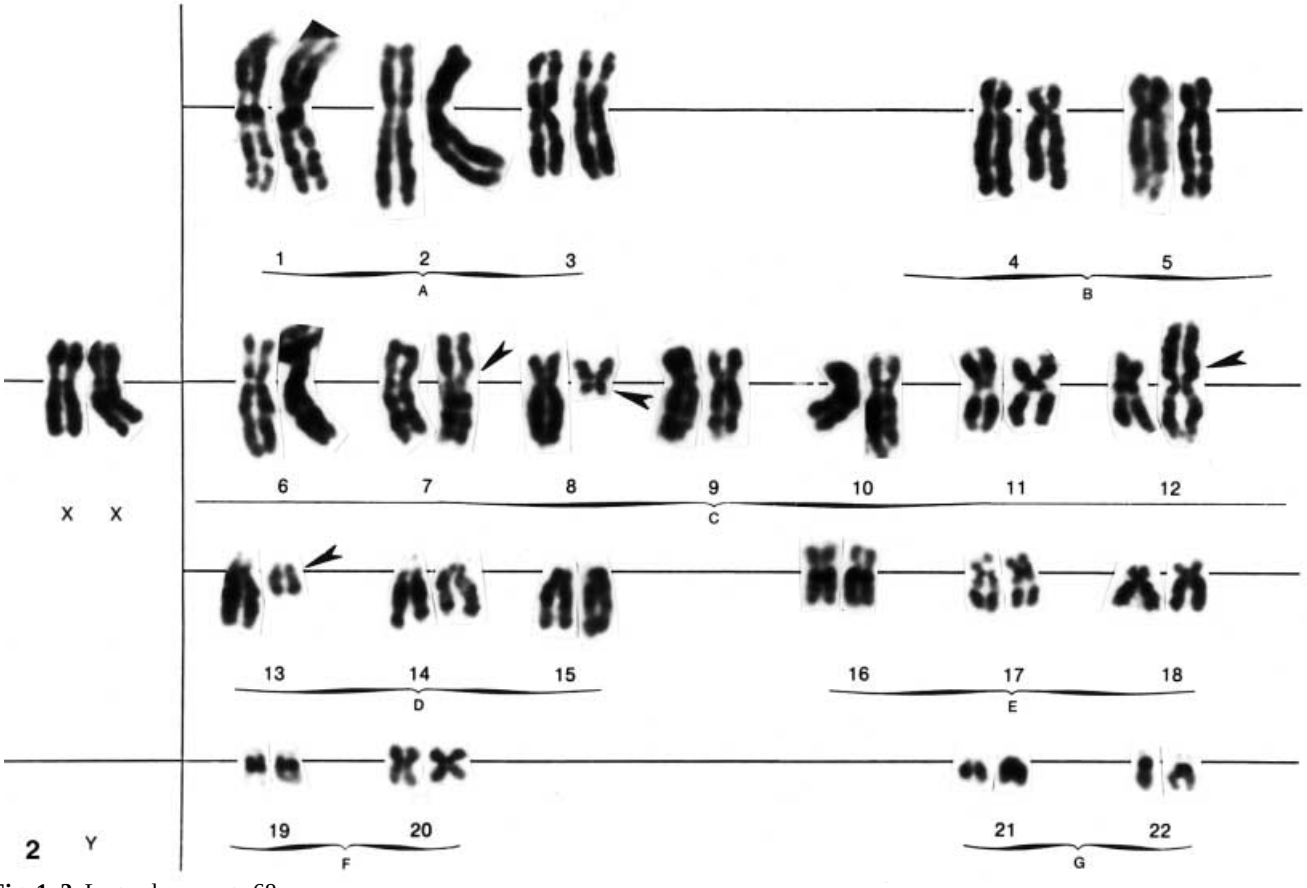


Fig. 1–2 Legend see page 68

component was absent (Fig. 1). Focally, a relatively mild lymphoplasmocytic infiltration was seen. There was no HMB45 expression. CD34 decorated the endothelial lining of the vessels and a few cells in the myxoid areas.

A total of 20 metaphases were analyzed. Three cells were normal, whereas 17 cells displayed a 46,XX,der(7)t(7;13)(p15;q14),t(8;12)(q13;p13),der(13)t(7;13) (Fig. 2). Two-colour FISH was performed using whole chromosomes 7 and 13 painting probes (Cambio, Cambridge, UK) according to the manufacturer's instructions. Molecular cytogenetics analysis confirmed the presence of one normal chromosome 7 (red) and 13 (green), with derivative chromosome 7 containing material from chromosome 13q and derivative chromosome 13 containing material from 7p.

Discussion

Cytogenetic analysis of benign soft tissue tumors has identified several highly specific chromosome aberrations that correlate with a morphologically defined subtype. The translocations t(7;13)(p15;q14) and t(8;12)(q12;p13) seen in the presented case of angiomyxolipoma engage chromosomal regions that are involved in certain benign adipose tissue and myxoid tumors. In ordinary lipomas, both balanced and unbalanced chromosome 13 aberrations have been found, either as the sole anomaly or as additions to rearrangements of 12q13–15, and region 13q12–22 appears to be most often involved [5,11]. Another lipomatous tumor that shares related chromosome aberrations with the presented case of angiomyxolipoma is spindle cell/pleomorphic lipoma. Although this tumor is usually associated with monosomy 16 or unbalanced aberrations leading to loss of the long arm of chromosome 16, most cases also display total or partial loss of chromosome 13 (due to deletions or unbalanced translocations) [12]. In addition, spindle cell lipomas with 13q but without discernible 16q anomaly have also been reported [1]. From a morphologic point of view, angiomyxolipoma may show some resemblance with the pseudoangiomatoid or myxoid variant of spindle cell lipoma [4,6]. However, the location, the lack of typical histological features such as a neural-like spindle cell component, ropy collagen and mast cells and diffuse CD34 expression, together with the presence of true vessels render a diagnosis of spindle cell lipoma unlikely.

Angiolipoma, myxolipoma and angiomyolipoma have different histological appearances. In addition, the cytogenetic analysis appears to be normal in the vast majority of these tumors. [2,13,15].

◀ **Fig. 1** Low power view of the tumor, showing the adipose tissue, the myxoid areas and the dilated vascular structures (H&E ×120)

Fig. 2 G-banded karyotype from the angiomyxolipoma showing complex chromosome changes (*arrowheads*):t(7;13)(p15;q14), t(8;12)(q13;p13)

Among the benign myxomas, only cardiac and juxta-articular myxomas have been reported to display clonal karyotypic changes [3,16]. Interestingly, involvement of the short arm of chromosome 12 as clonal and nonclonal abnormalities was observed in the former, while involvement of 8q12 was found in the latter. Both of these chromosomal regions were implicated in our case.

In addition to the histological features, cytogenetic and FISH analysis allowed us to differentiate our case from more aggressive tumors, such as atypical lipoma and aggressive angiomyxoma. The most striking feature of atypical lipomatous tumors is the presence of supernumerary ring and/or long-marker chromosomes [14], while aggressive angiomyxoma appears to be associated with 12q13–15 rearrangement [8]. None of these features were present in our case.

In summary, this study demonstrates that angiomyxolipoma shares similar genetic aberrations with ordinary lipoma, spindle cell/pleomorphic lipoma and myxoma. Although additional cases should be karyotyped, these clonal chromosomal changes may pave the way for the search into possible common molecular genetic mechanisms in these related tumors.

Acknowledgement This text presents research results of the Belgian program on interuniversity poles of attraction initiated by the Belgian State, Prime Minister's Office, Science Policy Programming. The scientific responsibility is assumed by the authors.

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